



# Standard Test Method for Temperature-Change Resistance of Clear Nitrocellulose Lacquer Films Applied to Wood<sup>1</sup>

This standard is issued under the fixed designation D 1211; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This test method covers determination of the resistance to checking and cracking of clear nitrocellulose lacquer films applied to wood or plywood substrates when subjected to sudden changes from high to low temperatures.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

### 2.1 ASTM Standards:

- D 805 Methods for Testing Veneer, Plywood, and Other Glued Veneer Constructions<sup>2</sup>
- D 2571 Guide for Testing Wood Furniture Lacquers<sup>3</sup>

## 3. Terminology

### 3.1 Definitions of Terms Specific to This Standard:

3.1.1 True cold-checks on solid wood show as one or more straight cracks on the applied film. Cold-checks manifest themselves in either of two ways:

3.1.1.1 Long continuous wavy lines with the grain or at various directions at angles that can be perpendicular to the direction of the grain.

3.1.1.2 Innumerable fine lines erratic in direction and length forming a network over a portion or all of the panel. This effect may be likened to crazing of the lacquer film.

3.1.1.3 On plywood the direction of the cracks will often vary because of the stresses set up by other than the top stratum. Therefore, all checks may be considered as failures, and appropriate notations on the character of the cracks must be made to assist in the interpretation. While it is recognized that cracks in the substrate may occur (veneer checking),

failures observed in the lacquer coating may be due to action of moisture (humidity) or of cold, or both. Checking caused by moisture appears along the grain and is characterized by short cracks (usually not more than 1/2 in. (13 mm) in length) occurring either singly or in clusters. These lines or clusters may progress along the grain in a discontinuous fashion. Should either veneer checking or moisture checking be observed, the test should be discontinued, and rerun.

3.1.2 The checks may be perceptible only by visual observation of the panels at an angle, under a strong light, or the cracks may be wide enough to be readily discernible in direct daylight.

## 4. Summary of Test Method

4.1 Lacquer-coated wood panels are subjected first to a high temperature, followed by an exposure to low temperature, and then a return to room temperature for given periods of time, which constitutes one cycle. The method does not define the number of cycles which a lacquer must withstand, this condition being a requirement which must be agreed upon by the purchaser and the seller.

## 5. Significance and Use

5.1 A common type of failure of clear films applied to wood is cracking or checking that may occur over a period of time either with the grain or at an angle. This cold check test is designed to accelerate the appearance of checks or cracks by cycling the temperature.

NOTE 1—Except when elaborate precautions are taken to control the moisture content of the wood before and after finishing and during the test, failures may quite often occur as a result of dimensional changes in the wood due to moisture change rather than temperature change.

## 6. Apparatus

6.1 *Refrigerator (Dry Ice)*—The refrigerator should be a well-insulated box, cooled by air which has been circulated over solid carbon dioxide (dry ice). The air must strike the panels indirectly after passing over the solid carbon dioxide. The unit shall have a capacity and temperature control sufficient to cool the test panels in accordance with the requirements prescribed in Section 9.

6.2 *Mechanical Refrigerator*—As a less desirable alternative, a well-insulated mechanical refrigerator may be used having sufficient capacity to cool the test panels in accordance

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<sup>2</sup> Discontinued; see 1976 Annual Book of ASTM Standards, Part 22.

<sup>3</sup> Annual Book of ASTM Standards, Vol 06.02.